I conſidered further that by the breadth of the hole F through which the Light enters into the Dark Chamber, there is a Penumbra made in the circuit of the Spectrum Y, and that Penumbra remains in the rectilinear Sides of the Spectrums P T and *pt*. I placed therefore at that hole a Lens or Object-glaſs of a Teleſcope which might caſt the Image of the Sun diſtinctly on Y without any Penumbra at all, and found that the Penumbra of the Rectilinear Sides of the oblong Spectrums P T and *pt* was alſo thereby taken away, ſo that thoſe Sides appeared as diſtinctly defined as did the Circumference of the firſt Image Y. Thus it happens if the Glaſs of the Priſms be free from veins, atd their Sides be accurately plane and well poliſhed without thoſe numberleſs waves or curles which uſually ariſe from Sand-holes a little ſmoothed in poliſhing with Putty. If the Glaſs be only well poliſhed and free from veins and the Sides not accurately plane but a little Convex or Concave, as it frequently happens; yet may the three Spectrums Y, P T and *pt* want Penumbras, but not in equal diſtances from the Priſms. Now from this want of Penumbras, I knew more certainly that every one of the circles was refracted according to ſome moſt regular, uniform, and conſtant law. For if there were any irregularity in the Refraction, the right Lines A E and G L which all the circles in the Spectrum P T do touch, could not by that Refraction be tranſlated into the Lines *a e* and *g l* as diſtinct and ſtraight as they were before, but there would ariſe in thoſe tranſlated Lines ſome Penumbra or crookedneſs or undulation, or other ſenſible Perturbation contrary to what is found by Experience. Whatſoever Penumbra or Perturbation ſhould be made in the circles by the croſs Refraction of the ſecond Priſm, all that Penumbra or Perturbation would be conſpicuous in the

the right Lines *a e* and *g l* which touch thoſe circles. And therefore ſince there is no ſuch Penumbra or Perturbation in thoſe right Lines there muſt be none in the circles. Since the diſtance between thoſe Tangents or breadth of the Spectrum is not increaſed by the Refractions, the Diameters of the circles are not increaſed thereby. Since thoſe Tangents continue to be right Lines, every circle which in the firſt Priſm is more or leſs refracted, is exactly in the ſame Proportion more or leſs refracted in the ſecond. And ſeeing all theſe things continue to ſucceed after the ſame manner when the Rays are again in a third Priſm, and again in a fourth refracted Sideways, it is evident that the Rays of one and the ſame circle as to their degree of Refrangibility continue always Uniform and Homogeneal to one another, and that thoſe of ſeveral circles do differ in degree of Refrangibility, and that in ſome certain and conſtant Proportion. Which is the thing I was to prove.

There is yet another Circumſtance or two of this Ex- *Fig.* 16.
periment by which it becomes ſtill more plain and convincing. Let the ſecond Priſm D H be placed not immeately after after the firſt, but at ſome diſtance from it; Suppoſe in the mid-way between it and the Wall on which the oblong Spectrum P T is caſt, ſo that the Light from the firſt Priſm may fall upon it in the form of an oblong Spectrum, $\pi 1$ Parallel to this ſecond Priſm, and be refracted Sideways to form the oblong Spectrum *p t* upon the Wall. And you will find as before, that this Spectrum *p t* is inclined to that Spectrum P T, which the firſt Priſm forms alone without the ſecond; the blew ends P and *p* being further diſtant from one another than the red ones T and *t*, and by conſequence that the Rays which go to the blew end π of the Image $\pi 1$ and which therefore ſuffer the greateſt Refraction in the firſt Priſm, are again in the ſecond Priſm more refracted than the reſt.

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